

REMARKS

The election of claims 1-9 in response to the restriction requirement is affirmed.

Claim 1 has been amended to incorporate the features of claims 4 and 5 (which have been canceled) and to recite a lower limit for the amount of oxygen. Basis for this latter amendment is found in the eighth paragraph of the specification following the heading "SUMMARY OF THE INVENTION". Amended claim 1 also makes clear that the product of the claimed method has a fractal-like surface structure. Moreover the word "about", previously used in connection with a specified pressure range, has been deleted.

In paragraph 8 of the Official Action, claims 1-9 were rejected under 35 U.S.C. § 103 as being unpatentable over Drake alone or in combination with Wasa.

In Kakinoki (listed in "references cited" but not discussed in the Official Action), titanium is vapor deposited on aluminum foil at an angle which allows the formation of column like structures. In the deposition process, the presence of oxygen and nitrogen are undesired (col. 7 lines 35-45).

In Drake, an anodizable metal is vapor deposited on a substrate at an angle less than 60° and in presence of a trace amount of oxygen at a partial pressure not exceeding 10^{-4} torr. The deposit thus obtained is described as having (e.g.) a "highly porous columnar structure" (col. 3, lines 4-9), similarly to Kakinoki.

Drake neither discloses nor suggests how his process might be modified to produce the fractal-like structures obtained in accordance with the present invention. Therefore, Drake taken on its own cannot make the presently claimed invention obvious.

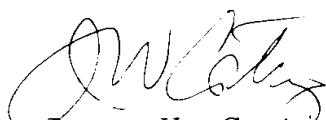
In Wasa, a mixture of lead and titanium oxides is formed on a substrate (e.g. of titanium on glass) by sputtering from a composite cathode containing lead and titanium, in an oxidizing atmosphere such as argon containing oxygen. In an example, the partial pressure of oxygen and the total pressure of the argon/oxygen mixture is specified.

Lead is not a valve metal, and its utilization does not fall within the scope of the present invention. Wasa teaches neither the structure of the sputtered deposit, nor what the effect might be of using only a valve metal without lead. The product of Wasa's procedure consists entirely of oxides, whereas the present application teaches away from a product which contains excessive oxide (see e.g., the fourth paragraph in Example 1). Moreover, Wasa certainly does not teach how to make the fractal like surface structures produced by applying the method of the present invention.

It is far from clear what the effect might be of combining Drake, in which the deposit forms columnar metal structures, and no oxidation of the deposited metal is mentioned, with Wasa, in which the deposit consists only of oxides of unspecified structure. It is also not clear what the motivation of a person of the art might be for making such a combination. Wasa, like Drake, does not disclose or suggest how to produce fractal-like structures. Therefore, notwithstanding that the pressures used in the cited references may bear some similarity to those in present claim 1, Drake combined with Wasa also cannot make obvious the presently claimed method.

An early and favorable action is earnestly solicited.

Respectfully submitted,

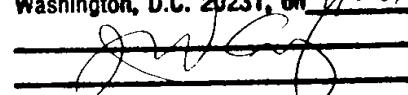


James V. Costigan
Reg. No 25,669

MAILING ADDRESS

HEDMAN & COSTIGAN, P.C.
1185 Avenue of the Americas
New York, NY 10036
(212) 302-8989

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MARKED UP COPY OF AMENDED CLAIM:

1. (Amended) A method for increasing the surface area of a substrate, comprising the steps of:
 - (a) placing the substrate in an inert atmosphere having a pressure of between about 10^{-3} torr and about 10^{-2} torr, into which oxygen has been introduced at a pressure of from one to two orders of magnitude less than said pressure of said inert atmosphere; and
 - (b) evaporating a valve metal onto the substrate under said oxygen-containing inert atmosphere, [t] whereby the product has a fractal-like [imparting a] surface structure [to the substrate].